

### REMARKS

Claims 8, 10, 11, 15-24, 26, 30-35, 42, 43, 45-49, 51-56, 58-60, 64-72 and 74-80 are now pending in the above-referenced patent application. Of these, claims 58 and 59 have been considered withdrawn as being drawn to non-elected species. The Applicants respectfully request further consideration of these claims.

#### Cancelled Claims

Claims 2, 4, 5, 29, 36, 44, 50, 57, 61-63 and 73 have been cancelled to advance the prosecution of the instant case. Applicants expressly reserve the right to refile the cancelled claims, without prejudice, in a continuing application. Applicants' cancellation of these claims should not, in any way, be considered as an admission with respect to any outstanding rejections applying to such claims, and Applicants hereby expressly deny any such interpretation. Likewise, Applicants cancellation of these claims should not, in any way, be considered as a surrender of any subject matter covered by the cancelled claims or any equivalents thereof, and Applicants hereby express their intent to pursue patent coverage for such subject matter and equivalents thereof.

#### Amended Claims

The independent claims have each been amended to more particularly point out and distinctly claim what Applicants regard as their invention. Specifically, claims 42, 68 and 70 have each been amended to require that the array comprise inorganic materials. Claims 42, 68, 70 and 72 have each been amended to clarify that the ten or more different materials are formed at predefined regions, and that each of at least ten of the materials are formed by sequentially delivering components thereof to form layers of the delivered components, while varying the composition, concentration, stoichiometry or thickness of the delivered components between respective regions. Claim 70 has been amended to require that each of at least ten of the different materials are formed by sequentially delivering five or more different components to form five or more layers of the delivered components. Claims 42, 68 and 72 have each been amended to require that the ten or more different materials are formed on a rigid substrate. Claim 72 has been amended, as well, to be directed to a method for identifying

useful materials, to require that each of at least ten of the different inorganic materials are formed by allowing the delivered components to simultaneously interact under set of common process conditions, and to further require screening the ten or more different materials for a property of interest and determining the relative performance of the materials with respect to the screened property.

Dependent claims 30-35 have each been amended to more particularly point out and distinctly claim what Applicants regard as their invention by clarifying that each of at least ten of the materials comprises the stated number of components. Dependent claims 43, 69 and 71 have each been amended to more particularly point out and distinctly claim what Applicants regard as their invention by clarifying that the methods are directed to identifying useful materials, and by further requiring that the relative performance of the at least ten different materials is determined with respect to the screened property. Dependent claims 64 and 65 have been amended, without change in the substantive scope thereof, to be consistent with amendments to the independent claims from which they depend.

No new matter has been added.

#### New Claims

New claims 74-80 have been added to more particularly point out and distinctly claim certain preferred embodiments of the invention. No new matter has been added.

#### Abstract

The Office action states that the application does not include an abstract as required under 37 CFR § 1.72(b). (See paragraph 10 at page 6 of the Office action).

Applicants are providing a replacement copy of the abstract as originally filed, together with a copy of documentation evidencing its original submission and receipt by the Patent and Trademark Office. No new matter has been added.

#### Claim Objections

Claims 30-36 are objected to in the Office action due to informalities relating to the relationship between “materials” and “components”. (See paragraph 11 at page 6 of the Office action).

Applicants respectfully traverse this objection with respect to claims 30-35. The rejection is moot with respect to claim 36, now cancelled.

Claims 30-35 appear to be consistent with the specification, and in fact, with the proposed claim language recommended in the Office action. The specification states, in this regard, that “(T)he resulting material may comprise a layer, blend or mixture of components on a predefined region of a substrate.” (See page 13, lines 26-28 of the specification). Claims 30-35 are each dependent from claims 42 or 43, and, as amended, require that at least ten of the ten or more different materials comprise a certain number of components (e.g., three or more components in claim 30). Hence, the claim language is consistent with the specification with respect to the relationship between materials and components thereof.

Accordingly, further amendment of claims 30-35 does not appear to be warranted. Further clarification is requested if Applicants have misunderstood the basis for this objection.

#### Rejections Under 35 U.S.C. § 112, 2<sup>nd</sup> Paragraph

Each of the previously pending, non-withdrawn claims have been rejected under 35 USC §112, 2<sup>nd</sup> paragraph as being indefinite for various reasons set forth in the Office action, with respect to various groups of claims. (See, generally, paragraphs 17-28 at pages 7-11 of the Office action).

Each of these rejections are obviated and/or traversed in view of the amendments to the claims and/or the following remarks.

#### *Different Materials*

Each of the previously-pending, non-withdrawn claims are said to be indefinite with respect to the requirement that the ten or more inorganic materials being formed on the substrate materials are “different” from each other. (See paragraph 17 at page 7 of the Office action).

Applicants respectfully traverse this basis for rejection.

Applicants submit that “different” material as used in the claims and the specification would have a definite and distinct meaning to a person of skill in the art, particularly in view of the specification. Both the claims and the specification clearly recite that the invention relates to an array of diverse materials comprising ten or more different materials in distinct

predefined regions. The differences in materials are characterized, for example, by differences in structure that can effect differences in the property of interest. The specification teaches that such differences can be effected, at least in part for example, by varying the relative composition, concentration, stoichiometries and/or thicknesses of the delivered components between regions, and additionally if desired, by varying the processing conditions between respective regions.

The ascribed alternative meanings upon which the Office action appears to base its rationale for indefiniteness would be inconsistent with other claim terms when considered in context. Specifically, the Office action appears to be concerned that “different” materials could mean “materials in different locations of the array”. However, the relative location of the materials is addressed in the claims by requiring the ten or more inorganic materials to be formed on ten or more predefined regions of the substrate, respectively. As such, a skilled artisan would understand that the required “different materials” relates to the aforementioned differences in the materials, rather than differences in location within the array.

Hence, a skilled artisan would understand whether or not they infringe the invention as presently claimed with respect to different materials. As such, this indefiniteness rejection should be withdrawn.

#### *Sufficient Space Between Regions*

Each of independent claims 42 and 72, together with claims dependent therefrom (*i.e.*, claims 2, 4-5, 8, 10-11, 15-24, 26, 29-36, 43-57, 60, 64-67 and 73) are said to be indefinite with respect to the requirement that the substrate comprise a sufficient amount of space between the predefined regions such that the delivered components do not substantially interdiffuse between regions. (*See* paragraph 18 at page 8 of the Office action).

Applicants respectfully traverse this basis for the rejections.

A skilled artisan would be able to determine whether or not they infringe the inventions defined by independent claims 42 and 72, and claims dependent therefrom.

The Office action states that it is unclear what a “sufficient amount” of space is – because, if deposited as solids, such solids would have a limited ability to interdiffuse and that therefore, “sufficient space could include no space at all” and the solids “may be placed directly next to each other”. (*See* paragraph 18 at page 8 of the Office action). However, the

reasoning set forth in the Office action disregards an express requirement of these claims – namely, that the predefined regions of the substrate be defined by a *space* between regions. Moreover, the technical premise of the reasoning is inaccurate, as diffusion between solids can and does readily occur – particular in connection with typical post-delivery processing of the delivered components. As such, it would be clear to a skilled artisan that the claims would not be interpreted to read on materials situated directly next to (*i.e.*, in contact with) each other – with “no space at all” – as contemplated in the Office action.<sup>1</sup>

The Office action further states that the recited claim language is unclear with respect to use of the qualifying term “substantially” in connection with “interdiffuse”. (*See* paragraph 18 at page 8 of the Office action). However, the law is clear that the use of such a term of degree does not make the recited language indefinite. *See* MPEP §2173.05(b). *See also In re Nehrembergh*, 126 USPQ 383 (CCPA 1960), and Andrew Corp. v. Gabriel Electronics, Inc., 6 USPQ2d 2010 (Fed. Cir. 1988). In the present case, a person of skill in the art would appreciate, in view of the guidance provided in the specification, that the space between adjacent component-containing regions should be such that the delivered components do not diffuse between adjacent regions to an extent that causes cross-contamination of the resulting materials.<sup>2</sup> (*See* page 20, line 31 through page 21, line 18 of the specification; *see also* page 23, line 24 through page 27, line 29 of the specification).

Accordingly, because a skilled artisan could determine the metes and bound of the inventions as presently claimed, the claims cannot be considered to be indefinite.

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<sup>1</sup> As noted in the specification and discussed below in connection with the rejections under 35 USC §102/103(a), the isolation of the predefined regions (*e.g.*, using spacing between regions) advantageously distinguishes prior art approaches such as U.S. Patent No. 4,545,646 to Chern *et al.*, which discloses an array comprising a *continuous* compositional gradient of materials.

<sup>2</sup> Significantly, such cross-contamination would preclude meaningful screening results without characterization of the formed materials, since the results could not be readily and directly correlated to the synthesis protocols associated with a material at the particular screened region.

### *Spatial Density of Material-Containing Regions*

Claims 51-56 are said to be indefinite with respect to the requirement that the spatial density of the material-containing regions is greater than about a specified value per specified area, in that "it is not clear what limitations apply to "about". (See paragraph 19 at page 8 of the Office action).

Applicants respectfully traverse this basis for rejection.

A skilled artisan can readily determine whether or not they infringe these claims by counting the number of material-containing regions within a particular area and determining the spatial density. As noted above, it is well settled that terms of degree, such as "about", are acceptable in claim language, and have been expressly held as being definite by the courts. See MPEP §2173.05(b). See also Ex Parte Eastwood, 163 USPQ 316 (BPAI 1968); W.L. Gore & Assoc., Inc. v. Garlock, 220 USPQ 303 (Fed. Cir. 1983). As such, the present basis for rejection is inappropriate.

### *Methods for Evaluating Diverse Materials*

Claims 43, 69, 71 and 73, together with claims dependent therefrom (*i.e.*, claims 2, 15-22, 29-36 and 44-67) are said to be incomplete for omitting essential steps. It is asserted, specifically, that the claims as written "omit the steps required for screening". (See paragraphs 20 at page 8 of the Office action).

The present rejection is obviated with respect to claims 43, 69 and 71 in view of amendments thereto considered together with the following comments.<sup>3</sup> The rejection is obviated as well with respect to claim 73, now cancelled.

As amended, claims 43, 69 and 71 (as well as amended claim 72 and new claim 74) are directed to methods for identifying useful materials. The methods defined by these claims

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<sup>3</sup> Applicants respectfully disagree with the analysis set forth in the Office action that these claims, as previously pending, omitted essential steps. The inventions defined by claims 43, 69 and 71 prior to amendment, together with claims depending therefrom, were directed to methods for evaluating an array of diverse materials. The methods required, *inter alia*, making particularly-characterized arrays, and then screening the arrays for a property of interest. The invention was complete, as recited, without further amendment. Nonetheless, Applicants have amended these claims to advance prosecution of the instant case.

comprise making particularly-characterized arrays of different inorganic materials, screening the materials for a useful property of interest, and determining the relative performance of the materials with respect to the property of interest.

The specification is clear that such steps can be used to identify useful materials according to the present invention. (See, for example, page 17 at lines 8-9, page 17 at lines 20-31, and page 18 at lines 10-11). As such, no steps are omitted, and the present basis for rejection is obviated.

#### *Screening Materials for a Useful Property of Interest*

Claims 43, 69, 71 and 73, together with claims dependent therefrom (*i.e.*, claims 2, 15-22, 29-36 and 44-67) are said to be indefinite in that the claims “fail to set forth any of the steps for screening” and that the claims “fail to set forth what a property of interest is.” (See paragraphs 21 and 22 at page 9 of the Office action).

The present rejection is traversed with respect to claims 43, 69 and 71 in view of amendments thereto considered together with the following comments. The rejection is obviated as well with respect to claim 73, now cancelled.

As amended, claims 43, 69 and 71 (as well as amended claim 72 and new claim 74) are directed to methods for identifying useful materials. The methods defined by these claims comprise making particularly-characterized arrays of different inorganic materials, screening the materials for a useful property of interest, and determining the relative performance of the materials with respect to the property of interest.

Applicants respectfully submit that a skilled artisan could determine whether or not they infringe the invention as presently claimed. The claims, as pending, require determining (*e.g.* measuring) the property of interest for the ten or more materials of the particularly-characterized array. The particular steps employed by a skilled artisan to screen the array of diverse materials are not critical with respect to practicing the present invention. As such, the Office action does not set forth a *prima facie* basis as to why a skilled artisan would not be able to define the metes and bounds of the invention as defined by these claims.

With respect to the useful property of interest, Applicants respectfully assert that the claims, as presently pending, are not indefinite with respect to screening the materials “for a useful property of interest.” A person of ordinary skill in the art can readily delineate whether

or not they are screening materials for a useful property – that is, for a particular quality, trait or function that is useful in (or that imbues the material with utility in) a particular application. Properties of particular interest are well-known in the art for many types of inorganic materials. Moreover, the specification provides substantial guidance with respect to delineating properties of interest. For example, properties can be broadly classified as including electrical, thermal, mechanical, morphological, optical, magnetic and/or chemical properties. *See*, for example, page 53, lines 27-28. An extensive, more specific, non-limiting list of “useful properties” is also set forth. *See*, for example, Table 1 on pages 54 and 55 of the specification. In view of the knowledge in the art, and the guidance presented by the specification, persons of ordinary skill have a clear understanding of what is and what is not a “useful property”; the term adequately defines the metes and bounds of the invention. Hence, the requirement to screen the materials for one or more useful properties of interest has a definite and well-understood meaning in the art. *See In re Gardner*, 166 USPQ 138, 140 (CCPA 1970). As such, this requirement cannot be considered to be indefinite.

#### *Delivery Techniques*

Claims 24 and 66 are said to be indefinite in that “it is unclear if the [sic: components of the] materials are delivered by a method comprising or consisting of the recited techniques.” (*See* paragraph 23 at page 9 of the Office action).

Applicants respectfully traverse this basis for rejection.

A skilled artisan would know whether or not they infringe based on a plain reading of these claims. Claim 24 requires that the components of the inorganic materials be delivered to the predefined region of the substrate using a delivery technique selected from the group of particularly-recited techniques. Claim 66 requires that the components of the inorganic materials be delivered to the predefined region of the substrate using a particular technique, namely electron beam evaporation. As such, the claims clearly define the covered delivery techniques. To the extent the Office action is concerned about claim format, Markush-type claims are well accepted for claiming alternative process embodiments of an invention. *See* MPEP §2173.05(h)) and cases cited therein.

Accordingly, these claims are not indefinite.



### *Regions*

Each of independent claims 42, 68, 70 and 72, together with claims dependent therefrom (*i.e.*, claims 2, 4-5, 8, 10-11, 15-24, 26, 29-36, 43-67, 69, 71 and 73) are said to be indefinite with respect to the regions in which components are required to be delivered. (*See* paragraph 24 at pages 9-10 of the Office action).

This basis for rejection is obviated in view of the amendments to the claims. As amended, each of the independent claims requires that components of the different inorganic materials be delivered to the respective predefined regions of the substrate. The term “predefined region” has a definite meaning as used in the specification (*See*, for example, page 12, lines 20-30 of the specification; *See also* page 23, line 5 through page 27, line 29 of the specification). As such, the present basis for rejection is obviated.

### *Components*

Claims 30-36 are said to be indefinite with respect to the relationship between the stated number of components and the ten or more materials. (*See* paragraph 25 at page 10 of the Office action).

This basis for rejection is obviated with respect to claims 30-35 in view of the amendments thereto, which clarify that each of at least ten of the ten or more different materials comprises the stated number of components, and with respect to claim 36, now cancelled.

### *Component Interaction*

Claim 48 is said to be indefinite with respect to the particular technique by which components are required to interact with each other to form the at least ten different materials. (*See* paragraph 26 at page 10 of the Office action). Specifically, the Office action states that claim 48 “recites that the components interact without reacting, intermingling, interdiffusing... or fusing”, and that it is unclear how the materials can interact “when the claim appears to exclude every possible means” of interacting.

Applicants respectfully traverse this basis for rejection. The Office action appears to have inadvertently misconstrued claim 48 as excluding each of the listed interaction techniques. Accordingly, the invention defined by claim 48 is not indefinite.

### *Layers in Regions*

Claim 65 is said to be indefinite with respect to the relationship between the ten or more different materials and the three or more layers thereof. (See paragraph 27 at page 10 of the Office action). Claims 15-20 are likewise said to be indefinite with respect to the relationship between the ten or more different materials and the three or more layers thereof. (See paragraph 28 at pages 10-11 of the Office action).

This basis for rejection is obviated in view of the amendments to claims 42 and 65 and the following remarks. As amended, the invention defined by claim 42 (from which claims 15-20 and 65 ultimately depend) requires that each of the ten or more materials comprises layers of delivered components. The component layers for each of the ten or more materials are within the respective regions associated with each material. Accordingly, a skilled artisan would understand whether or not they infringe the invention defined by these claims.

### Rejections Under 35 U.S.C. § 112, 1<sup>st</sup> Paragraph (Written Description)

Claim 48 is rejected under 35 USC §112, 1<sup>st</sup> paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to a person of skill in the art that the inventors were in possession of the claimed invention at the time the application as filed. The Office action states that claim 48 “recites that the components interact without reacting, intermingling, interdiffusing.... or fusing.” (See paragraphs 13 and 14 at page 7 of the Office action).

Applicants respectfully traverse this rejection.

Applicants note that the Office action may have misread claim 48 as excluding each of the listed interaction techniques. (See related discussion above with respect to indefiniteness concerns for claim 48). Written description support for claim 48 may be found, for example, at page 63, lines 13-17 of the specification.

### Rejections Under 35 U.S.C. § 112, 1<sup>st</sup> Paragraph (Enablement)

Each of the previously-pending, non-withdrawn claims have been rejected under 35 USC §112, 1<sup>st</sup> paragraph, as lacking enablement. Specifically, the Office action asserts that the

specification would not have enabled a skilled artisan to make and use the invention commensurate with the scope of the claims.

Applicants submit that this basis for rejection is obviated in view of the amendments to the claims, considered together with the following remarks.

As amended, each of the previously-pending claims is directed to making arrays comprising ten or more different inorganic materials by delivering two or more (claims 42, 68, 72) or five or more (claim 70) components thereof in sequential layers. Certain claims (*e.g.*, claims 43, 69, 71 and 72) are directed to using such arrays to identify useful materials. New claim 74 is directed to methods for identifying useful inorganic or non-biological polymeric materials.

Applicants submit that a skilled artisan would have been fully enabled to make such arrays, and to evaluate such arrays for a property of interest, in view of the substantial guidance set forth in the specification, taken together with knowledge in the art at the time the application was filed.

The specification provides substantial guidance for making and screening arrays comprising diverse inorganic or non-biological polymeric materials according to the methods defined in presently-pending claims 42, 68, 70, 72, 74 and claims dependent therefrom. In particular, an overview of general and specific approaches is provided (*See* page 17, line 7 through page 23, line 3 of the specification), together with specific details regarding various component-delivery approaches. Thin-film deposition methods such as evaporative methods, glow-discharge processes, gas-phase chemical processes, liquid-phase chemical processes and multi-target thin-film deposition techniques are disclosed in significant detail, and are particularly suited to delivery of inorganic components. (*See*, for example, page 28, line 6 through page 37, line 13 of the specification, as well as page 40, line 23 through page 49, line 17 of the specification). Delivery with a dispenser is also described in significant detail, and is suitable for delivery of inorganic or non-biological polymeric components (*See*, for example, page 37, line 13 through page 40, line 22 of the specification, as well as page 46, line 10 through page 49, line 17 of the specification). The specification also describes various approaches for isolation of predefined regions (*See*, for example, page 23, line 24 through page 27, line 29 of the specification). Each of the disclosed approaches is particularly suitable for use in connection with inorganic elements or compounds as components for making arrays of

diverse inorganic materials. Processing of delivered components, required in some of the claims, is also particularly described, both with respect to inorganic materials, and with respect to non-biological polymeric materials. (*See*, for example, page 49, line 18 through page 53, line 11 of the specification). The specification further teaches that the arrays of inorganic materials can be screened according to many specifically-known techniques for specifically-known properties of interest. (*See*, for example, page 53, line 12 through page 58, line 4 of the specification). Moreover, numerous examples provided in the specification expressly demonstrate the inventions defined by the presently-pending claims – both for inorganic materials and for non-biological polymeric materials.

Extensive literature existing in the art at the time the application was filed demonstrates the level of knowledge known in the art regarding further particular aspects of each of the techniques described in the specification – with respect to both synthesis and screening of inorganic materials. Some of such literature is specifically referenced in the patent application. (*See*, for example, page 28, lines 20-24 of the specification, referencing the “Handbook of Thin-Film Deposition Processes and Techniques”; *See also* page 38, line 6 of the specification, referencing EP 260965 of Wong *et al.*).

Contrary to the position set forth in the Office action, the specification would have enabled a skilled artisan to fully practice the inventions as presently claimed without undue experimentation. The Office action asserts, *inter alia*, that the specification fails to provide adequate guidance to correlate the selection of specific delivery techniques and/or specific components to a particularly-desired property of interest. (*See* subparagraphs 1a, 1b and 1c of paragraph 7, at pages 3-4 of the Office action, and subparagraph 5 of paragraph 7, at page 5 of the Office action.). However, such assertion appears to misconstrue the nature and purpose of present invention. The invention is not directed to particular *materials* having particular properties. The invention is also not directed to *a priori* prediction of a correlation between delivery techniques and/or components to particular properties. Rather, the present invention is directed to *methods for making arrays where the arrays are useful for identifying materials* having a particular property of interest, and to *methods for identifying useful materials* by using such arrays. As such, a skilled artisan would be able to practice the present invention by selecting materials and/or components thereof in a completely random fashion, without consideration of known underlying scientific principles and/or without consideration of

specific relationships between particular materials or components and a particular property of interest. Alternatively, and more logically, a skilled artisan would be able to practice the invention by selecting materials and/or components starting, for example, from known scientific principles or from specifically known material-property relationships.

Additionally, with regard to the latter approach, the Office action appears to discount the vast warehouse of knowledge existing in the art upon which a skilled artisan could base appropriate initial selections for components and delivery techniques for making arrays of materials. With respect to the state of the prior art, the Office action appears to consider only the then-existing art related to making arrays of materials, with specific reference to “biologically relevant organic materials”. (See subparagraph 4a of paragraph 7 at page 5 of the Office action). The Office action does not appear to consider the teaching of numerous references directed to the forming of inorganic materials in singular fashion, or directed to material-property relationships of known materials. The teaching of such references, considered in combination with the instant specification, could have been readily applied by a skilled artisan to make arrays of inorganic materials or non-biological polymeric materials as required in the presently-pending claims. Likewise, the Office action does not appear to consider the teaching of numerous references directed to screening methodologies that could have been applied, in view of the teaching of the specification, to evaluate the arrays of inorganic materials. The law is clear that a patent specification need not teach, and preferably omits what is generally known in the art. See Hybritech v. Monoclonal Antibodies, 231 USPQ 81, 94 (Fed. Cir. 1986). As such, Applicants are entitled to rely on such knowledge in the art in combination with the further teaching of the instant specification.

Moreover, even if some experimentation were required to adapt such methods for use in connection with the present invention, the Office action does not establish, *prima facie*, that the level of experimentation required would have been undue to practice the invention as claimed. See In re Wands, 8 USPQ2d 1400 (Fed. Cir. 1988).

Accordingly, a skilled artisan would have been enabled to make and to evaluate arrays comprising inorganic materials, as presently claimed.

Rejections Under 35 U.S.C. §102(e) – Cavicchi *et al.*

The Office action rejects each of the independent claims 42, 68, 70 and 72, together with certain claims dependent therefrom (claims 2, 4-5, 8, 10, 11, 15-19, 23, 24, 26, 29-36, 43-54, 57, 60, 64-66, 69, 71 and 73) as being anticipated under 35 U.S.C. §102(e) by U.S. Patent No. 5,365,756 to Cavicchi *et al.* (*See*, generally, paragraph 30 at pages 11-15 of the Office action).

Among other aspects,<sup>4</sup> Cavicchi *et al.* is said to teach an array of materials comprising two or more layers. The Office action makes reference to the growth of an epitaxial GaAs layer on a Si substrate in the context of Col. 13, lines 5-26 of Cavicchi *et al.* (*See* page 12, lines 5-7) of the Office action). The Office action also states that Cavicchi *et al.* teaches “that layers of materials can be applied on those which have previously been applied”, without reference to the supporting portion of Cavicchi *et al.* (*See* page 13, last paragraph).

Applicants respectfully traverse this basis for rejection.

Cavicchi *et al.* discloses fabrication of a plurality of micro-hotplates on a common substrate, each of which can be controlled independently from each other with respect to temperature and/or voltage bias. The reference discloses that the array of micro-hotplates can be used for process optimization by exploring the effects of locally-varying processes conditions – particularly in connection with deposition studies and materials development (*e.g.*, film microstructure analysis, processing of high-temperature superconductors, thermal-fatigue testing, melt transition temperatures, gas-surface interaction studies, *etc.*). The reference also discloses end-use applications such as chemical sensors.

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<sup>4</sup> The Office action sets forth numerous conclusive statements regarding what Cavicchi *et al.* teaches with respect to various claimed aspects of the invention, and /or regarding what Applicants claims mean. Applicants expressly disagree with many of the statements asserted in the Office action in this regard. Some particular points of disagreement are discussed herein, to the extent necessary to distinguish the invention defined by the presently pending claims. Applicants have not, however, specifically addressed other particular points of disagreement, since such points are moot in view of the arguments set forth by Applicants. Applicants are not conceding the factual accuracy of any statements set forth in the Office action, except to the extent expressly admitted by Applicants. Applicants do not admit or acquiesce to statements in the Office action upon which Applicants have not commented.

Contrary to the assertions made in the Office action, Cavicchi *et al.* does not disclose making an array comprising ten or more different inorganic materials to be tested for a useful property, where at least ten of the materials are formed, at least in part, by delivering two or more components to respective regions to form two or more layers of delivered components, while varying the relative composition, concentration, stoichiometry and/or thickness of the delivered components between respective regions.

With respect to the epitaxial layer of GaAs referred to in the Office action, a skilled artisan would have understood that when read in context, the GaAs material is formed as a single layer – and is not a test material comprising two or more layers of delivered components. More specifically, the referenced portion of Cavicchi *et al.* would have been understood as describing applications in which electronic devices are fabricated using high-temperature processing or high-temperature device operation for some components on the chip, while thermally isolating other components on the chip. (See Col. 13, lines 5-9 of Cavicchi *et al.*). As one example, Cavicchi *et al.* discloses chemical sensors, such as can be based on semiconductor oxides materials formed as a film over the contact pad (numbered as “10” in Figure 4) of the micro-hotplate, where ohmic contact to the semiconductor oxide is provided by interdiffusion between the contact pad and the semiconductor oxide. (See Col. 13, lines 9-19 of Cavicchi *et al.*). As an alternative approach, Cavicchi *et al.* discloses providing a thermally-isolated *substrate* that includes exposed crystalline Si upon which GaAs can be epitaxially grown, without thermal damage to other devices on the wafer.

Hence, a skilled artisan would have understood both of these disclosed embodiments as teaching the formation of material comprising a single layer to be tested in the micro-hotplate device of Cavicchi *et al.*. The underlying substrate, the underlying micro-hotplate, or portions thereof (*e.g.*, the “contact pads” or the “exposed crystalline Si”), would not have been considered as part of the material being tested. As such, this teaching of Cavicchi *et al.* does not anticipate the inventions defined by the presently-pending independent claims, each of which require that the material being made for testing comprise, in its final or intermediate form, two or more layers of delivered components.

As noted above, in the Office action Cavicchi *et al.* is also said to teach “that layers of materials can be applied on those which have previously been applied.” However, the Office action does not provide reference to the portion of Cavicchi *et al.* upon which it is relying for

such assertion. Applicants acknowledge, in this regard, that Cavicchi *et al.* disclose that after deposition of materials onto the micro-hotplate, the resulting array of samples can be subjected to various post-processing treatments that include the “subsequent deposition of additional materials”. (See Col. 10, lines 41-46). However, the Cavicchi *et al.* reference does not teach whether such “additional materials” are to be deposited to the same micro-hotplate (*i.e.*, over the previously-deposited material) or to other micro-hotplates within the array. The reference appears to teach the latter, as the following paragraphs describe various approaches for selectively depositing to various selected micro-hotplates within the array. (See, for example, Col. 10, lines 47-64 (selective conventional lithography), and Col. 10, line 65 through Col. 11, line 16 (selective “maskless” lithography)). Moreover, the Cavicchi *et al.* reference does not teach whether such “additional materials” are the same as or different from the earlier-deposited materials. In particular, the reference does not disclose controlling the relative composition of the delivered components to vary between the ten or more respective regions to form the ten or more different materials.

Hence, the Cavicchi *et al.* reference would not have been understood by a skilled artisan as disclosing the inventions defined by the presently-pending claims, which require delivery of a first component to form a first layer in each of the ten or more predefined regions of the substrate, with subsequent delivery of a second component to form a second layer over the first layer in each of the ten or more regions, while varying the composition, concentration, stoichiometry and/or thickness of the delivered components between respective regions. As such, Cavicchi *et al.* does not anticipate the presently-pending claims.

Applicants note, moreover, that new claims 77 and 80 require steps and features not disclosed in Cavicchi *et al.* Specifically, claim 77 requires that the at least ten materials are formed by allowing the delivered first and second components thereof to simultaneously interact under a common set of conditions. Claim 80 requires that the array of different materials consists essentially of the substrate and ten or more different materials – thereby excluding substrates comprising active elements such as micro-hotplates as taught by Cavicchi *et al.*



Rejections Under 35 U.S.C. § 103(a) – Cavicchi et al.

The Office action alternatively rejects each of the independent claims 42, 68, 70 and 72, together with certain claims dependent therefrom (claims 2, 4-5, 8, 10, 11, 15-19, 23, 24, 26, 29-36, 43-54, 57, 60, 64-66, 69, 71 and 73) as being obvious under 35 U.S.C. §103(a) over U.S. Patent No. 5,365,756 to Cavicchi et al. (See, generally, paragraph 30 at pages 11-15 of the Office action). The Office action acknowledges that Cavicchi et al. discloses only as many as 500 micro-hotplate structures formed in a common substrate, but posits, nonetheless, that it would have been *prima facie* obvious to prepare arrays having large numbers of materials. (See page 14, last paragraph of the Office action).

The Office action also rejects each of claims 20-22, 55, 56 and 67 as being obvious under 35 U.S.C. §103(a) over U.S. Patent No. 5,365,756 to Cavicchi et al. The Office action acknowledges that Cavicchi et al. fail to teach (i) synthesis of 10,000 or more materials, (ii) regions having a spatial density of greater than about 10 regions per cm<sup>2</sup>, or (iii) materials prepared from two or more components where one component is the same between materials and the other component is different between materials. The Office action argues, however, that each of such differences would have been obvious over Cavicchi et al. (See, generally, paragraph 34 at pages 19-21 of the Office action).

Applicants respectfully traverse these rejections.

The Office action does not establish a *prima facie* case of obviousness, because the requisite motivation has not been established as existing in the art.

*The Present Invention, Considered as a Whole, Would Not Have Been Obvious*

A determination of obviousness must consider the claimed invention as a whole. That is, “in determining the differences between the prior art and the claims, the question under 35 USC 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious. See MPEP 2141.02; See also Stratoflex, Inc. v. Aeroquip Corp., 218 USPQ 698 (Fed. Cir. 1983) (emphasis in original); Ecolochem, Inc. v. Southern California Edison Company, 99-1043 (Fed. Cir., Sept. 7, 2000).

A skilled artisan would not have been motivated by Cavicchi et al. to arrive at the inventions defined by the presently claimed inventions when such inventions are properly viewed as a whole. As noted above, Cavicchi et al. discloses an array of micro-hotplates, and

teaches that localized control of temperature and/or voltage bias between micro-hotplates can be used for exploring the effects of process conditions in various applications. However, unlike Cavicchi *et al.*, the present invention enables materials discovery based on controlling and exploring the effects of composition (alone, or in combination with variations in process conditions). Significantly, Cavicchi *et al.* does not contemplate or suggest such an application for the disclosed array of micro-hotplates.

Moreover, Cavicchi *et al.* does not disclose, teach or suggest the advantages associated with forming arrays of diverse materials in the manner claimed by Applicants – with successive delivery of layers (*e.g.*, thin films) of two or more components to respective regions of the substrate. As disclosed in the instant application, such an approach advantageously allows for synthesis of materials with increased reaction rates and at lower temperatures by reducing the diffusion path length and increasing the surface to volume ratio. (*See*, for example, page 50, lines 16-21 of the specification). Ultimately, the benefits associated with such an approach can result in micro-scale, high-density, homogeneous solid-state compositions (*e.g.*, alloys) that can be representative of materials formed by bulk synthesis protocols. A skilled artisan would not have recognized such advantages based on the disclosure of Cavicchi *et al.*

Accordingly, a person of skill in the art would not have been motivated to practice the presently-claimed inventions.

Moreover, the Office action appears to improperly extrapolate the teachings of Cavicchi *et al.* without proper motivation for such extrapolation. In view of the repeated warnings by the Federal Circuit against hindsight reconstruction (*i.e.*, against finding the required motivation in the guidance of the instant specification), Applicants respectfully submit that such extrapolation is improper under the law. *See*, for example, *In re Vaeck*, 20 USPQ2d 1438 (Fed. Cir. 1991).

For the aforementioned reasons, the inventions defined by the presently-pending claims cannot be considered to be obvious over Cavicchi *et al.*

In addition to these aforementioned fundamental distinctions, the inventions defined by some of the presently-pending claims are further distinguished from Cavicchi *et al.* with respect to additional commercially-significant features, as discussed hereinafter.

### *Number of Materials*

As noted above, Cavicchi *et al.* discloses that as many as 500 micro-hotplate structures (together with associated drivers and multiplexers) could be formed in a common substrate (See Col. 14, lines 17-19 of the Cavicchi *et al.* patent), and that as many as 1000 micro-samples can be prepared in the time that one sample was prepared using conventional techniques. (See Col. 3, lines 43-46). The Office action asserts, however, that a skilled artisan would have been motivated to make arrays with even larger numbers of materials, because “*this would allow one to prepare and test multiple samples at once*” (See page 14, last paragraph of the Office action), and moreover, because this would “*accelerate the research process and to be able to perform parallel exploration of a wide parameter space for materials processing*.” (See page 20, lines 4-5 of first full paragraph, emphasis added).

Even if, *arguendo*, Cavicchi *et al.* would have motivated a skilled artisan to prepare a large number of samples (*e.g.*, 1000) for exploring materials processing, such motivation would not have led to Applicant’s invention. Applicant’s invention is not merely directed to preparing large numbers of materials – but rather, to preparing large numbers of different materials by controllably varying the composition of the delivered components, and thereby allowing for exploration of wide compositional parameter space. Hence, contrary to the assertions in the Office action, Cavicchi *et al.* would not have motivated a skilled artisan to controllably vary the composition, concentration, stoichiometry and/or thickness of delivered components to prepare large numbers of different materials – such as ten or more (claims 42, 68, 70, 72, 74 and claims dependent therefrom), and especially with respect to higher numbers of different materials – such as twenty, fifty, one hundred, five hundred, ten thousand, one hundred thousand or one million or more different materials (claims 15-22, respectively). In fact, because Cavicchi *et al.* is focused on exploration of process parameter space, the reference *teaches away* from the inventions defined by the present claims. As such, the presently-claimed inventions would not have been obvious over Cavicchi *et al.*

### *Region Density*

As noted, the Office action acknowledges that Cavichii *et al.* does not disclose regions having a spatial density of greater than about 10 regions per cm<sup>2</sup>. The Office action argues, however, that a person skilled in the art would have been motivated to have as many as 100

regions per  $\text{cm}^2$  because “Cavicchi *et al.* teach that microfabrication techniques permit defining structures at resolutions of less than 0.1 mm” and because “Cavicchi *et al.* teach the benefit of making microarrays.” (See page 20, lines 9-15 of the first full paragraph thereof).

Applicants respectfully disagree with the asserted basis for motivation. The Office action fails to consider both express and inherent limitations associated with the Cavicchi *et al.* micro-hotplates that are particularly relevant to the issue of spatial density of regions on the substrate. First, Cavicchi *et al.* expressly acknowledge that the size of the micro-hotplates is limited, on the low-end, by the necessity for thermal isolations between regions. (See Col. 8, lines 5-9 of Cavicchi *et al.*). Moreover, the micro-hotplates disclosed by Cavicchi *et al.* necessarily and inherently require peripheral components such as a plurality of leads that could interface with external drivers and multiplexers. (See Figure 5, and Col. 7, lines 21-29 of Cavicchi *et al.*).

In view of such limitations, a skilled artisan would not have been motivated to arrive at the inventions defined by claims requiring different materials at a spatial density of least about 10 or 100 regions per  $\text{cm}^2$ , as required by claims 55, 56 and 72). It is well settled that no suggestion or motivation can be established for proposed modifications to a prior art embodiment, where such modifications would render the prior art embodiment unsuitable or unsatisfactory for its intended purpose. See MPEP 2143.02; See also *In re Gordon*, 221 USPQ 1125 (Fed. Cir. 1984). In the present case, a skilled artisan would not have been motivated to modify the array of micro-hotplates disclosed by Cavicchi *et al.* to achieve the high region density required in the aforementioned claims of Applicants’ invention, since such modification would have rendered the Cavicchi *et al.* array unsuitable for its intended purpose.

#### *Component Relationships Between Regions*

The Office action also acknowledges that Cavicchi *et al.* does not disclose materials prepared from two or more components where one component is the same between materials and the other component is different between materials. The Office action argues, however, that each of such differences would have been obvious over Cavicchi *et al.* because “*the reference teaches masking for the application of materials to selective regions of the array*”. (See page 20, last sentence wrapping to page 21 of the Office action).

Applicants respectfully submit that the asserted motivation would not have led to the invention as defined by claim 67 – where ten or more materials are formed by delivering two or more components thereof to respective regions of a substrate, with one component being the same between regions and one component being different between regions. Although Cavicchi *et al.* disclose that lithographic masking techniques can be employed to deposit materials onto regions of a substrate, such *general* teaching would not have led a skilled artisan to the *specific* invention defined by Applicants in this claim. . See In re Fine, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Dow Chemical Co., 5 USPQ2d 1529 (Fed. Cir. 1988); In re Geiger, 2 USPQ2d 1276 (Fed. Cir. 1987). The law requires a more specific suggestion in the art than merely by the commonality of one potential method of fabrication. Because the Office action does not provide evidence of such specific motivation or suggestion, it does not establish a *prima facie* case of obviousness.

#### *Features in New Claims*

As noted above, new claim 77 requires that the at least ten materials are formed by allowing the delivered first and second components thereof to simultaneously interact under a common set of conditions. Additionally, new claim 80 requires that the array of different materials consists essentially of the substrate and ten or more different materials – thereby excluding substrates comprising active elements such as micro-hotplates as taught by Cavicchi *et al.*

A skilled artisan would not have been motivated to modify the array of micro-hotplates disclosed by Cavicchi *et al.* to achieve the inventions defined by these claims, since such modification would have rendered the Cavicchi *et al.* array unsuitable for its intended purpose. See MPEP 2143.02; See also In re Gordon, 221 USPQ 1125 (Fed. Cir. 1984).

#### *Errata*

As discussed in connection with footnote 4 hereof, the Office action sets forth various statements with which Applicants do not agree, and/or which create certain inferences that are not accurate, in some cases in view of amendments to the claims. The following remarks are set forth to clarify Applicants position regarding certain of such statements.

It is stated, for example, that Cavicchi *et al.* teaches “that *materials* can be delivered [sic: in] sequentially to different regions as required by claim 5.” (See page 13 of the Office action). Applicants note, for clarification, that claim 5, now cancelled, required sequential deposition of *components* of the each material at each predefined region – not sequential deposition of the *materials* themselves. Hence, it is completely within the scope of Applicants invention, as presently defined, that with respect to any one particular predefined region, components are sequentially delivered to form successive layers of delivered components, whereas, considered between various regions, the components for different materials (and, indeed, the materials themselves) can be delivered (and/or formed) simultaneously relative to the components (and/or materials) in other regions.

It is also stated, in connection with claim 23, that Cavicchi *et al.* teaches “physical masking”. (See page 13 of the Office action). The Office action does not, however, provide any citation for the asserted teaching regarding “physical masking”.

The Office action states as well, that Cavicchi *et al.* teach that “the applied components... may react (*e.g.* Sn and oxygen react to give SnO<sub>2</sub>)”. (See page 14 of the Office action). Applicants note, in this regard, that presently-pending claims 46-49 require interaction between delivered components – after such components have been delivered as layers in each respective region. As such, the asserted teaching of Cavichhi *et al.* is not instructive with respect to the claimed inventions, since the Sn component is not delivered as a layered component and subsequently allowed to interact with another delivered layered component.

Rejections under 35 U.S.C. §102(b) / §103(a) – Chern *et al.*

The Office action rejects each of the independent claims 42, 68, 70 and 72, together with certain claims dependent therefrom (claims 2, 4-5, 8, 10, 11, 15-24, 26, 29, 42-44, 46-57, 60, 64, 66, 69, 71 and 73) as being anticipated under 35 U.S.C. §102(b) by U.S. Patent No. 4,545,646 to Chern *et al.*<sup>5</sup> (See, generally, paragraph 31 at pages 15-17 of the Office action).

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<sup>5</sup> Applicants acknowledge that claims 30-36, 45, 65 and 67 are not rejected based on Chern *et al.*

The Office action rejects each of the aforementioned claims, in the alternative, under 35 U.S.C. §103(a) as being obvious over Chern *et al.*

Among other aspects, Chern *et al.* is said to teach methods for forming a continuous layer of material on a substrate, where the layer comprises a material having continuous gradations in refractive index in a predetermined periodic pattern. The Office action characterizes the layer further, as follows:

“As the materials set down is a solid (*e.g.*, SiOx), the space between the materials required to prevent substantial diffusion is no space at all. Moreover, the regions having a difference in thickness approach the infinitesimal values (*e.g.*, zero) when the gradient is continuous. Thus, there are effectively infinite regions each corresponding to the infinitesimal differences in thickness over the range of thicknesses.”

(See paragraph 31, bottom of page 15 and wrapping to page 16, emphasis added).

Applicants respectively traverse this basis for rejection.

With respect to the issue of anticipation, Chern *et al.* do not disclose forming an array comprising ten or more different materials on ten or more discrete predefined regions of a substrate, as required by each of the independent claims. Rather, Chern *et al.* disclose a continuous layer of material that comprises variations in composition.<sup>6</sup>

Contrary to the assertions in the Office action, a person of skill in the art would not have interpreted such a continuous layer as comprising an infinite number of *discrete predefined regions* (as required in the instant claims), with each region each having a material varying infinitesimally with respect to composition or thickness, and with each region being discrete from each other due to a spacing that is no space at all. Stated equivalently, although the claims of a patent application are entitled to their broadest possible interpretation – both during examination and after grant – construing the instant claims in a manner that reads on the embodiments disclosed in Chern *et al.* is inconsistent with the plain language of the claims, as well as the specification.

Moreover, the Office action appears to mischaracterize the disclosure of Chern *et al.* with respect to deposition of materials onto what is asserted as being “regions”. It is said, for

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<sup>6</sup> Applicants note, in this regard, that the cited Chern *et al.* is substantially analogous to the approach taught by Hanak, as exemplified by Hanak, The ‘Multiple-Sample Concept’ in Materials Research: Synthesis, Compositional Analysis and Testing of Entire Multicomponent Systems, Journal of Materials Science, Vol. 5, pp. 964-971 (1970).

example, that Chern *et al.* teach that “photovapor deposition materials... can be delivered [sic: to] specific regions being illuminated”, (See page 16, fourth full paragraph), and that “masks can be used to limit the illumination to specific segments”. (See page 16, fifth full paragraph). When read in context, however, it is clear that each of the aforementioned statements refer to embodiments of Chern *et al.* involving continuous layers having compositional gradients formed by locally varying the relative amounts of components in a spatially continuous manner – not with respect to spatially discrete, predefined regions.

Further, Chern *et al.* does not disclose an array comprising ten or more different materials where at least ten of the materials are formed, at least in part, by delivering two or more components to respective regions to form two or more layers of delivered components, as required by each of the independent claims, as amended. Applicants note, in this regard, that the Office action appears to concur with Applicants’ analysis regarding the aforementioned lack of disclosure, since claim 45 (requiring at least ten of the ten or more different materials to comprise layers of delivered components) and claim 65 (requiring at least ten of the ten or more different materials to comprise three or more layers) were not rejected over Chern *et al.*

Accordingly, the inventions defined by the presently-pending claims cannot be considered as being anticipated by Chern *et al.*

With respect to obviousness, the Office action does not set forth a *prima facie* case of obviousness because it does not establish the requisite motivation.

In fact, a person of skill in the art would not have been led to Applicants invention. The Chern *et al.* patent *teaches away* from the presently claimed invention, by stressing the significance of the continuous graded-index optical materials (See, for example, Col. 5, lines 15-45), and by specifically teaching the advantages of the continuous single-layer embodiment disclosed therein over the prior art multi-layer dielectric filters. (See, for example, Col. 1, line 40 through Col. 2, line 11; Col. 9, lines 25-30; Col. 10, lines 21-25; and Col. 10, lines 56-62). Accordingly, the inventions defined by the presently-pending claims would not have been obvious over Chern *et al.*

#### Rejections under 35 U.S.C. §102(e) – Rolleston *et al.*

The Office action rejects independent claims 42, 68 and 72, together with certain claims dependent therefrom (claims 2, 5, 8, 10, 11, 24, 26, 29-31, 36, 42-44, 46-47, 49-54, 64,



69 and 73) as being anticipated under 35 U.S.C. §102(e) by U.S. Patent No. 5,416,613 to Rolleston *et al.*<sup>7</sup> (See, generally, paragraph 32 at pages 17-19 of the Office action).

Specifically, the Office action states that Rolleston *et al.* discloses an array of color patches by deposition of three colorants, or in some embodiments four colorants, onto a paper substrate, and use thereof for calibration of color printers. (See page 18, first paragraph of the Office action).

Applicants submit that the present rejections are obviated in view of the amendments to the claims.

Specifically, the claims, as amended, require one or more of several significant features that are not disclosed by Rolleston *et al.*.

First, Rolleston *et al.* do not disclose arrays comprising ten or more different inorganic materials as required in claims 42, 68, 70, 72 and claims depending therefrom. Applicants note that the Office action appears to concur, since each of claims 57, 60, 70 and 71 (each requiring inorganic materials) were not rejected over Rolleston *et al.*.

Additionally, Rolleston *et al.* do not disclose arrays formed by combination of five or more components as required by claim 70 and claims dependent therefrom. The Office action appears to concur, since each of claims 32-35 (requiring at least five, six, seven or eight components, respectively) were not rejected over Rolleston *et al.*.

Moreover, Rolleston *et al.* do not disclose arrays comprising ten or more different materials being formed on a rigid substrate as required in claims 42, 68, 72 and claims dependent therefrom.

Furthermore, contrary to assertions set forth in the Office action, Applicants respectfully submit that Rolleston *et al.* do not disclose use of an array of ten or more different materials in a method for identifying useful materials, where the method requires determining the relative performance of the at least ten different materials with respect to the property of interest. The Rolleston *et al.* patent discloses that the array of color patches are used for printer calibration – that is, for determining the performance of the *printer* as compared to known,

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<sup>7</sup> Applicants acknowledge that claims 4, 15-23, 32-35, 45, 48, 55-57, 60, 65-67, 70 and 71 are not rejected based on Rolleston *et al.*

device-independent standards – not for determining the relative performance of the *materials*. Accordingly, the inventions defined by claims 43, 69, 71, 72 and 74, each of which require determination of the relative performance of the formed materials, are not anticipated by Rolleston *et al.*

Applicants note as well that, with respect to the spatial density of the material-containing regions, the Office action acknowledges that Rolleston *et al.* disclose an array comprising the color patches at a density of about 1.2 regions per cm<sup>2</sup>. Accordingly, Rolleston *et al.* does not anticipate the inventions defined by claims 55, 56 or 72.

Rejections Under 35 U.S.C. § 103(a) – Rolleston *et al.*

The Office action alternatively rejects each of the independent claims 42, 68 and 72, together with certain claims dependent therefrom (claims 2, 5, 8, 10, 11, 24, 26, 29-31, 36, 42-44, 46-47, 49-54, 64, 69 and 73) as being obvious under 35 U.S.C. § 103(a) over U.S. Patent No. 5,416,613 to Rolleston *et al.* (See, generally, paragraph 32 at pages 17-19 of the Office action).

The Office action also rejects claim 67 as being obvious under 35 U.S.C. § 103(a) over the same Rolleston *et al.* patent. (See paragraph 35 at page 21 of the Office action). The Office action acknowledges, in this regard, that Rolleston *et al.* do not teach materials prepared from two or more components where one component is the same between materials and the other component is different between materials.

The rejection of independent claims 42, 68 and 72, and dependent claims 2, 5, 8, 10, 11, 24, 26, 29-31, 36, 42-44, 46-47, 49-54, 64, 69 and 73, is obviated in view of the claim amendments, together with the following remarks.

Applicants inventions defined by these claims – when properly viewed as a whole – would not have been considered to be obvious over Rolleston *et al.* A skilled artisan would not have been motivated to prepare arrays of diverse materials according to the methods claimed herein, and moreover, would not have been motivated to use such arrays as claimed herein – to identify materials having useful properties, as part of a materials discovery program.

Applicants note, in particular with respect to claims 42, 68, 72 and claims dependent therefrom (each requiring that the array be formed on a rigid substrate), that a skilled artisan would not have been motivated to form an array of color patches as disclosed by Rolleston *et*

*al.* on a rigid substrate, because such modification would have rendered the Rolleston *et al.* array unsuitable for its intended purpose in connection with printer calibration. See In re Gordon, 221 USPQ 1125 (Fed. Cir. 1984).

With regard to claim 67, the Office action asserts that it would have been obvious to one of skill in the art to prepare an array comprising materials prepared from two or more components where one component is the same between materials and the other component is different between materials, because “*holding one or more components constant while varying the independent component would allow for systematic analysis of color space.*” (See page 21, last paragraph of the Office action).

Applicants respectfully traverse this rejection.

The basis for motivation set forth in the Office action appears to rely, improperly, on hindsight, and therefore does not establish *prima facie* obviousness. Rolleston *et al.* do not disclose, teach or suggest a desire for “systematic analysis of color space” as reasoned in the Office action. Rather, Rolleston *et al.* are applying *known* amounts of *known* components in *known* combinations to prepare a calibration standard, and teach that such standard can be employed for analysis and calibration of printer performance – not for “analysis of color space.” The Office action appears to be improperly relying on the teaching of the present invention – regarding systematic exploration of compositional space to identify materials having useful properties – as motivation upon which the present rejection is based. Such an approach is improper under the law, and does not establish obviousness.

Hence, viewed as a whole, Applicants inventions as presently claimed cannot be considered obvious over Rolleston *et al.*

### Equivalents

The amendments to the claims and the arguments presented in response to the Office action have been made to more particularly point out and distinctly claim the subject matter which the Applicants regard as their invention. By such amendments, the Applicants in no way intend to surrender any range of equivalents beyond that which is needed to patentably distinguish the claimed invention as a whole over the prior art. Applicants expressly reserve patent coverage to all such equivalents that may fall in the range between applicants literal claim recitations and those combinations that would have been obvious in view of the prior art.

### Provisional Obviousness-Type Double Patenting Rejections

Each of the previously-pending, non-withdrawn claims have been rejected under the judicially created doctrine of obviousness-type double patenting as allegedly being unpatentable over various claims of, independently, U.S. Patent No. 5,985,356 to Schultz *et al.*, and U.S. Patent No. 6,004,617 to Schultz *et al.* (See paragraphs 37-40 at pages 22-24 of the Office action).

Each of the previously-pending, non-withdrawn claims have also been provisionally rejected under the judicially created doctrine of obviousness-type double patenting as allegedly being unpatentable over various claims of, independently, copending U.S. patent applications Ser. No. 09/127,195 and Ser. No. 09/156,827.

Applicants will consider submitting a terminal disclaimer to obviate each of these rejection, if necessary, once substantive agreement on the merits is reached.

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### CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

The Examiner is hereby authorized to charge an amount of \$39 required under 37 CFR §1.16(b), together with any other additional necessary fees due in connection with this application, and/or to credit any overpayment of fees to Deposit Account No. 50-0496.

Respectfully submitted,



Date Submitted: 9-15-00

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